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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY

FOREST INSECT INVESTIGATIONS

REARING EXPERIMENTS FOREST INSECT LABORATORY COEUR D'ALENE, IDAHO 1934-1937 INCLUSIVE

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REARING EXPERIMENTS
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Introduction

The need for an insectary of sufficient size and arrangement to take care of the growing demands of the Coeur d'Alene laboratory became quite apparent in 1934. At that time a piece of property located as close to the federal building as it was possible to secure was leased by the Bureau of Entomology and Plant Quarantine. This property comprised a city lot 100' x 50', a small, four-room house, and a double garage. An insectary measuring 16' long, 8' wide, and 8' high was constructed on part of the remaining unoccupied ground. The exterior of the insectary was covered with a closely woven, galvanized wire screen and provided with a close-fitting door. The interior was provided with the necessary tables and shelves for holding all types of rearing cages. A six-foot wire fence surrounded the outside of the insectary both for protection and providing a small enclosure for the use of G.I. rearing cans and extra potted food plants. One small room in the house was fitted up for the collection of injurious insects and parasites from the rearing cages, two rooms were used for storage of spraying equipment, chemicals, etc., and one room for a workshop for constructing rearing equipment. This arrangement proved adequate for all the rearing and storage needs of the laboratory and was continued in use until the expiration of the lease in May 1937.

at which time the property was sold, and the insectary was moved to a new location on property rented by the Blister Rust division of the Bureau of Entomology and Plant Quarantine.

During the time the insectary has been in use 52 genera comprising 57 species of insects have been reared, including three new species of Hymenoptera and one new species of Diptera. Many beneficial parasites have been secured by rearing which otherwise would escape notice in the field, and with the order Lepidoptera all specimens secured by rearing are in much better shape for preservation and study than those collected in the field. All infested material collected by members of the Bureau of Entomology and Plant Quarantine in other localities outside the State of Idaho and shipped to the Coeur-d'Alene laboratory insectary for rearing has been transported under a special shipping permit, as well as thoroughly protected by screened cages. The same applies to all material transported in trucks or passenger cars. Extreme caution has been used in handling all infested material placed in rearing cages at the insectary to prevent the escape of the insects.

LIST OF INSECTS REARED AT COEUR D'ALENE, IDAHO
INSECTARY WITH THEIR HOSTS AND HOST LOCALITY

Order and Insect	Host	Locality
COLEOPTERA		
Agrilus politus (Say.)	Acer sp.	Salt Lake City, Utah
" "	Salix sp.	Coeur d'Alene N.F., Idaho
Altica bimarginata Say.	Native cottonwood	Coeur d'Alene, Idaho
" "	" alder	" " "
Anoplerda canadensis Oliv.	Ponderosa pine stump	" " "
Anthaxia deleta Lec.	Douglas fir twigs	" " "
Chrysomela scripta Fab.	Native cottonwood	" " "
Conophthorus flexilis Hopk.	Limber pine cones	Beaverhead N.F., Dillon, Montana
Conophthorus monticolae Hopk.	White pine cones	Coeur d'Alene N.F., Idaho Kaniksu N.F., Wash.
Cryptorpynchus lapathi (L.)	Aspen	Priest River, Idaho
" "	Cottonwood	Coeur d'Alene, Idaho
" "	Willow, native & cultivated	" " "
Holopleura marginata Lec.	Douglas fir twigs	" " "
Magdalis cuniformis Horn.	Ponderosa pine twigs	Sundance, Wyoming
Myeloboris iniquus Blkmn.	Limber pine twigs	Beaverhead N.F., Mont.
Pissodes coloradensis Hopk.	White pine	Kaniksu N.F., Port Hill, Idaho
" "	Engelmann spruce	" " " "
Pityophthorus albertensis Blkmn.	Whitebark pine twigs	Sheridan, Wyo.
Scolytus tsugae Sw.	Hemlock	Coeur d'Alene N.F., Idaho

Order and Insect	Host	Locality
Spondylis upiformis Mann.	Ponderosa pine stump	Coeur d'Alene N.F., Idaho
HYMENOPTERA		
Amblymerus verditor (Nort.)	Ponderosa pine cone moth larvae (Laspeyresia miscitata)	Coeur d'Alene, Idaho
" "	Douglas fir cone moth larvae Barbara c. colfaxiana	" " "
Apanteles laspeyresiae Vier	Ponderosa pine cone moth larvae	" " "
" "	Douglas fir cone moth larvae	" " "
" "	Agrilus politus	Coeur d'Alene N.F., Idaho
Apanteles n. sp.	Spruce needleminer larvae Taniva albolineana	" " , Idaho
Gallierphialtes comstocki (Cress.)	Ponderosa pine cone moth larvae	" " "
" "	Douglas fir cone moth larvae	" " "
Callimome sp. near occidentalis Huber.	Douglas fir cone moth larvae	" " "
Chelonus sp.	Spruce needleminer larvae	" " "
Coeloides dendroctoni Cush.	Agrilus politus larvae	" " N.F., Idaho
Coeloides scolyti Cush.	" " "	" " " "
Dibrachys n. sp.	Larch sawfly larvae L. ericksonii	Flathead N.F., Kalispell, Montana
Elachertus evetria Roh.	Ponderosa pine cone moth larvae	Coeur d'Alene, Idaho
" "	Douglas fir cone moth larvae	" " "

Order and Insect	Host	Locality
Epiurus aplopappi Ashm.	Spruce needleminer	Coeur d'Alene, Idaho
HYMENOPTERA		
Exura sp.	Agrilus politus larvae	Coeur d'Alene N. F.
Exochus evetriae Roh.	Douglas fir cone moth larvae	" " , Idaho
Ichneumon sp.	Agrilus politus larvae	" " N. F.
Itoplectis atrocoxalis (Cress.)	Douglas fir tussock moth pupae	Sawtooth N.F., Hailey, Idaho
Itoplectis montana Cush.	Ellopia fiscellaria lugubrosa larvae	Coeur d'Alene N. F.
Lissonota n. sp.	Whitebark pine cone moth pupae Dioryctria abietella	Beaverhead N.F., Dillon, Montana
Lygaeonematus ericksonii Konow.	Larch, Larix occidentalis	Flathead N.F., Kalispell, Montana
Megastigmus picea Roh.	Engelmann spruce seed	Savenac Nursery, Haugan, Montana
Meloboris laspeyresiae Roh.	Ponderosa pine cone moth larvae	Coeur d'Alene, Idaho
Microbracon rhyacioniae Mues.	Douglas fir cone moth larvae	" " "
Phanertoma laspeyresiae Roh	Ponderosa pine cone moth larvae	" " "
Pteromalus vanessae Harris	Tortoise shell butterfly larvae, Aglais california	Cabinet N.F., Mont.
DIPTERA		
Bessa selecta Mg.	Larch sawfly	Flathead N.F., Kalispell, Montana
Madremyia saundersii Will.	Douglas fir tussock moth larvae	Sawtooth N.F., Hailey, Idaho

Order and Insect	Host	Locality
Phaonia sp.	Cryptorrynchus lapathi larvae	Coeur d'Alene N.F., Idaho
Phrynolydella n. sp.	Ellopia fiscellaria lugubrosa larvae	" " " "
Plectops sp.	Lodgepole & ponderosa pine needle tyer pupae	Coeur d'Alene, Idaho
Retinodiplosis near inopes	Ponderosa pine twigs	" " "
LEPIDOPTERA		
Aglais california Bdr.	Native shrubs	Cabinet N.F., Thompson Falls, Mont.
Barbara c. colfaxiana Kearf	Douglas fir cones	Coeur d'Alene, Idaho
Dioryctria abietella D. & S.	White pine cones	" " "
	Whitebark pine cones	Beaverhead N.F., Sheridan Mont.
Dioryctria near abietella	Ponderosa pine cones	Coeur d'Alene, Idaho
" xanthoenobares Dyar	" " "	" " "
Ellopia fiscellaria lugubrosa Hlst.	Miscellaneous conifers and ground cover	Idaho and Montana
Eucosma bobana Kearf.	Whitebark pine cones	Beaverhead N.F., Dillon, Mont.
Eucordylea sp.	Lodgepole pine Ponderosa pine	Coeur d'Alene, Idaho
Gracilaria syringella Fabr.	Cultivated lilacs and privet hedges	" " "
Hemerocampa pseudotsugata McD.	Douglas fir	Sawtooth N.F., Hailey, Idaho
Laspeyresia miscitate Heinrich	Ponderosa pine cones	Coeur d'Alene, Idaho
Nepytia canosaria var. Wlk.	Douglas fir	Sawtooth N.F., Hailey, Idaho

Order and Insect	Host	Locality
Phyllonoryctes salicifoliella Clem.	Native and cultivated willows	Coeur d'Alene, Idaho
Taniva albolineana Kearf.:	Ornamental blue and Norway spruce	" " "

CONE INSECTS

Ponderosa Pine

Insectary rearings were made from infested ponderosa pine cones collected from five different localities in northern Idaho. The ponderosa pine cone moth Laspeyresia miscitate was found to be the primary insect causing seed losses varying from 6 to 62 percent, with an average of 29 percent. Six species of Hymenopterous parasites of the cone moth were also secured from the rearing experiment, as well as important information on the life history of the cone moth showing that many of the larvae remain in the cones until the second year after attack, thus assuring a continuation of the insects regardless of the intermittent ponderosa pine crop. Two other species of destructive cone moths were also reared from the cones.

White Pine

White pine seed having a high commercial value in this region for restocking burned and cut-over areas, considerable interest is aroused over losses to the seed crop caused by cone insects. Infested white pine cones have been received from the Forest Service Seed Extraction Plant at Priest River, Idaho and from the Kaniksu and Coeur-d'Alene National Forests. Rearings from the infested cones showed the white pine cone beetle Conophthorus monticolae to be the most abundant insect destroying the seed. A large cone moth was also secured from the rearings. The larvae of this moth, while very destructive, does not appear to be very common.

Whitebark pine

A number of infested whitebark pine cones were received from the Beaverhead National Forest. From these cones two species of cone moths were reared and also an undescribed species of Hymenoptera, a parasite of the cone moths.

Douglas Fir

Numerous reports of infested Douglas fir cones have been received from various forests in Region 1. From a large number of infested cones the following insects were reared: The Douglas fir cone moth, Barbara colfaxiana colfaxiana and seven species of Hymenoptera, parasites of the cone moth larvae. Four of the seven species had also been reared from ponderosa pine cones as parasitic on the larvae of Laspeyresia miscitata (cone moth).

Engelmann Spruce

From a shipment of infested Engelmann spruce seeds received from the Savenac Nursery at Haugan, Montana the spruce seed chalcid Megastigmus picea was reared. A large percent of the seeds had been destroyed by this insect.

Limber Pine

From infested limber pine cones collected on the Beaverhead National Forest the cone beetle Conophthorus flexilis was reared. All of the seed in the infested cones was destroyed by the feeding activities of the larvae of this cone beetle.

DEFOLIATORS

Lepidoptera

Hemerocampa pseudotsugata

Fir tussock moth larvae collected near Hailey, Idaho on the Sawtooth National Forest were received in 1936 and 1937, and a series of adults were secured both seasons by rearing. A shipment of pupae (chrysalids) was received from the same locality on September 14, 1937. These were collected from the infested area where introduced parasites, Compsilura concinnata Meig. and Ephialtes examinator Fab. were liberated July 17, 1937. While no emergence of either of the introduced parasites was secured, a large number of a Hymenopterous parasite Itoplectis atrocoxalis (Cuss.) emerged from the caged material. One species of a Dipterous parasite, Madremyia saundersii was reared from the cages containing the tussock moth larvae, and a small collection of parasitic cocoons were found in frass in the bottom of cages. These cocoons were placed in containers for overwintering, and several other species of parasites may be secured, as well as additional material from the overwintering tussock moth pupae.

Nepytia canosaria var.

This species of looper was present in the larval form in both lots of tussock moth larvae from near Hailey, Idaho. The proportion was approximately one Nepytia to six Hemerocampa. The loopers were transferred to a separate cage as soon as pupation took place, and a good series of adults were secured. No parasites were reared from this material.

Ellopia fiscellaria lugubrosa

During September and October 1937 numerous reports of Ellopia infestation were received from various forests in Region 1. Collections of larvae were made from heavily infested areas on the Coeur d'Alene National Forest. These larvae were placed in rearing cages at the insectary, and a large series of adults was secured, as well as a species of Hymenoptera and Diptera parasite, the later proving to be a new and undescribed species.

Spruce Needleminer, Taniva albolineana

The spruce needleminer was first reared at this laboratory from a shipment of infested Engelmann spruce collected near Hailey, Idaho in 1933. In 1934 this insect was reported as destructive to ornamental spruce in Coeur d'Alene, Idaho, becoming very abundant by 1936. A number of adults were reared from infested spruce as well as three species of beneficial Hymenopterous parasites, one of them being a new species.

Tortoise Shell Butterfly, Aglais california

Defoliation of shrubs as watershed protection by the larvae of this butterfly has been reported from time to time by various forests in Region 1. From a shipment of larvae received from the Cabinet National Forest, Montana adults were reared, also a beneficial Hymenopterous parasite.

MISCELLANEOUS

Lepidoptera

Willow Leaf Miner, Phyllonoryctes salicifoliella

Found to be very common on native willows and also collected from cultivated willows. Adults were reared from larvae.

Needle Tyer, Eucordylea sp.

This insect was found to be very abundant in both lodgepole and young ponderosa pine in the vicinity of Coeur d'Alene, Idaho. Adult moths secured from rearings as well as a Dipterous parasite.

DEFOLIATORS

Coleoptera

Chrysomela scripta (Fabr.)

During the season of 1934 the larvae of this species were very destructive to the foliage of the native cottonwoods in the vicinity of Coeur d'Alene, Idaho. Adults were reared from a collection of larvae. No dark forms were secured.

Altica bimarginata, Alder Flea Beetle

Requests from owners of summer homes were received during 1933 for examinations and control for the defoliator, particularly where working on native cottonwoods. Adults were reared from larvae collected from the cottonwoods and alders, and the life history for this locality partly worked out. Since then the beetles have been very scarce.

Hymenoptera

Lygaeonematus ericksonii, Larch Sawfly

A large number of cocoons of this species of sawfly collected on the Flathead were overwintered at the insectary 1934-35, 1935-36. Adults were secured during both seasons, and also a species of Hymenopterous and Dipterous parasite. The Hymenoptera was found to be a new species, as well as very beneficial.

Miscellaneous

Lilac Leaf Miner (Lepidoptera)
Gracilaria syringella

Many requests have been received from home owners for control measures for this insect. The life history for this locality was worked out from rearing experiments, and a suitable spray formula devised for control measures.

TWIG INSECTS

Coleoptera

From dead and dying twigs of Douglas fir collected in the vicinity of Coeur d'Alene, Idaho a small beetle, Anthaxia deleta Lec. (Buprestidae), and a species of Cerambycidae, Holopleura marginata Lec., were reared. This combination attack was causing the death of some of the smaller host trees.

A shipment of infested ponderosa pine twigs was received from Sundance, Wyoming. From these twigs a small weevil, Magdalis cuniformis, was reared. This weevil feeds on the foliage of various pine throughout

an extensive range in the western United States.

From whitebark pine twigs collected near Sheridan, Montana a rather rare bark beetle, Pityophthorus albertensis, was reared. And from rearing infested limber pine twigs collected near Wapiti, Wyo., the bark beetle Myeloborus iniquus was secured.

Diptera

For several years attempts were made to rear adults of the pine midge from infested twigs collected late in the fall. Results were finally obtained by collecting the twigs shortly before the pupation period in the spring. Adult Retinodiplosis sp. near inopsis were reared from material from the Northern Rocky Mountain Experiment Station at Priest River, Idaho and Coeur d'Alene, Idaho.

STEM INSECTS

Coleoptera

An examination of dead and dying willows forming valuable watershed protection over a large mountainous area on the Coeur d'Alene National Forest showed the presence of several destructive forest insects. Collections of the infested willows were made at various places and the material placed in rearing cages at the insectary. The willow weevil, Cryptorpynchus lapathi, was reared from the lower portions of the willows and Agrilus politus from the upper portion. Five Hymenopterous and one Dipterous parasite were also reared from the infested willows.

The willow weevil, Cryptorpynchus lapathi, was also reared from ornamental willows and native cottonwood from the vicinity of

Coeur d'Alene, Idaho and aspen from Priest River, Idaho.

During the summer of 1935 a small shipment of infested native maple from the vicinity of Salt Lake City, Utah was received for rearing. A good series of Agrilus politus was secured from the material.

During an insect survey in the northern portion of the Kaniksu National Forest in 1936 a combination attack of bark beetle and weevil was found in white pine and Engelmann spruce. Infested logs were brought to the insectary and adult weevils secured by rearing. The species was determined in Washington, D. C. as Pissodes coloradensis.

A good series of Scolytus tsugae adults were secured by rearing from infested hemlock collected on the Coeur d'Alene National Forest.

For several years rearing experiments were conducted to secure Spondylis upiformis larvae. The larvae of this beetle remain undescribed up to the present time. Adult beetles were collected in 1934-35-36-37 and confined in cages containing freshly cut ponderosa pine stumps embedded in sterilized soil. A good series of larvae was secured from these rearings. The larvae were found to work between the bark and wood below the ground level.

A small series of Anoplerda canadensis was reared during 1937 from the heartwood of a small decayed ponderosa pine stump. A few sculptured pine borer, Chalcophora angulicollis (Lec.) adults were also secured from this rearing showing a combination attack.

Respectfully submitted,

H. J. Rust
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